

Irrigation System Efficiency Improvements

2003 Urban Water Conservation Program Grant Application

submitted to

**California Department of Water Resources
Office of Water Use Efficiency
1416 Ninth Street, Room 338
Sacramento, CA 95814
Attention: Marsha Prillwitz (916)651-9674**

December 11, 2002

by the

**Yucaipa Valley Water District
12770 Second Street
Post Office Box 730
Yucaipa, California 92399-0730
Telephone: (909) 797-5117 Fax: (909) 797-6381
Contact: Jack Nelson**



Yucaipa Valley Water District

Cover Letter



December 11, 2002

Marsha Prillwitz
California Department of Water Resources
Office of Water Use Efficiency
1416 Ninth Street, Room 338
Sacramento, California 95814

Dear Ms. Prillwitz:

It is our honor to submit an application to the California Department of Water Resources 2003 Urban Water Conservation Grant Program. The enclosed application includes a request for a grant to upgrade landscape irrigation hardware that will conserve large volumes of water cost-effectively in our fast growing service area.

Please contact us if you have questions or if we can provide additional information.

Thank you for your consideration.

Sincerely,

Jack Nelson, Assistant General Manager

Table of Contents

Cover Letter	2
Table of Contents	iii
Application Part A — Project Description, Organizational, Financial and Legal Information	1
A-1 Urban Water Conservation Grant Application Cover Sheet	2
A-2 Application Signature Page	3
A-3 Application Checklist	4
A-4 Description of Project	5
Purpose, goals, and objectives	5
Location	5
Summary of methods and procedures	5
Summary of expected outcomes, benefits, and costs	6
A-5 Maps	8
A-6 Statement of Work, Schedule	9
Tasks	9
Deliverables	10
Schedule	11
Separability of tasks	11
Projected costs by task	11
Quarterly expenditure projection	14
Summary: Technical Adequacy and Readiness to Proceed	14
A-7 Monitoring and Evaluation	15
Assessment procedures:	15
Performance Measures	15
Products	16
A-8 Qualifications of the Applicant and Cooperators	17
A-9 Innovation	18
A-10 Agency Authority	19
A-11 Operations and Maintenance	20
Application Part B—Engineering and Hydrologic Feasibility	21
Application Part C—Plan for Completion of Environmental Documentation and Permitting Requirements	23
C-1 California Environmental Quality Act and National Environmental Policy Act	24
C-2 Permits, Easements, Licenses, Acquisitions, and Certifications	24
C-3 Local Land Use Plans	24
C-4 Applicable Legal Requirements	24
Application Part D- Need for Project and Community Involvement	25
D-1 Need for the Project	26
Urgency	26
Water system condition	26
Consistency with other water management plans	27
Impact if not constructed	28
D-2 Outreach, Community Involvement, Support, Opposition	29
Community based organizations and watershed groups	29
Fit with local agency plans	29

<u>Local agencies</u>	29
<u>Opposition</u>	30
<u>Application Part E—Water Use Efficiency Improvements and Other Benefits</u>	31
<u>E-1 Water Use Efficiency Improvements</u>	32
<u>Decrease in cost of using water:</u>	32
<u>Increased in value generated by the use of the water:</u>	32
<u>E-2 Other Project Benefits</u>	33
<u>Application Part F – Economic Justification: Benefits to Costs</u>	34
<u>F-1 Net Water Savings</u>	35
<u>Water savings</u>	35
<u>Reduce loss to atmosphere through evaporation or transpiration</u>	35
<u>Reducing losses to saline or other unusable aquifers or water bodies through percolation or surface flows</u>	35
<u>F-2 Project Budget and Budget Justification</u>	37
<u>F-3 Economic Efficiency</u>	38
<u>Appendix A- Benefit/Cost Analysis Tables</u>	40
<u>Table 1: Capital Costs</u>	41
<u>Table 2: Annual Operations and Maintenance Costs</u>	42
<u>Table 3: Total Annual Costs</u>	42
<u>Table 4a: Water Supply Benefits: Avoided Cost of Current Supply Sources</u>	43
<u>Table 4b: Water Supply Benefits: Alternative Cost of Future Supply Sources</u>	43
<u>Table 4c: Water Supply Benefits: Supplier Revenue (Vendibility)</u>	43
<u>Table 4d: Total Water Supply Benefits</u>	44
<u>Table 5: Benefit/Cost Ratio</u>	45
<u>Table 6: Capital Recovery Factor</u>	46

***Application Part A — Project Description,
Organizational, Financial and Legal Information***

A-1 Urban Water Conservation Grant Application Cover Sheet

1. Applicant (Organization or affiliation): Yucaipa Valley Water District
2. Project Title: Irrigation System Efficiency Improvements

3. Person authorized to sign and submit proposal:

Name, Title	<u>John "Jack" Nelson, Assistant General</u> <u>Manager</u>
Mailing address	<u>P.O. Box 730</u> <u>Yucaipa, CA 92399</u>
Telephone	<u>(909) 797-5119</u>
Fax	<u>(909) 797-6381</u>
E-mail	<u>jnelson@yvwd.dst.ca.us</u>

4. Contact person (if different):

Name, Title	<u>John (Jack) Nelson</u>
Mailing address	<u>P.O. Box 730</u> <u>Yucaipa, CA 92399</u>
Telephone	<u>(909) 797-5119</u>
Fax	<u>(909) 797-6381</u>
E-mail	<u>jnelson@yvwd.dst.ca.us</u>

5. Funds requested (dollar amount): \$100,000
6. Applicant funds pledged (local cost share) (dollar amount): \$60,662
7. Total project costs (dollar amount): \$160,662

8. Estimated net water savings (acre-feet/year): 100AF/YR
Estimated total amount of water to be saved (acre-feet):
Over 10 years 1,000AF

Benefit/cost ratio of project for applicant: 2.49
Estimated \$/acre-feet of water to be saved: 161\$/AF

9. Project life (month/year to month/year): 09/2003 to 09/2005 (Implementation)

10. State Assembly Districts where the project is to be conducted: 65th

11. State Senate District where the project is to be conducted: 31st

12. Congressional District(s) where the project is to be conducted: 40th, 44th

13. County where the project is to be conducted: San Bernardino & Riverside

14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?

(a) Yes

(b) No

X

A-2 Application Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.

Signature

Name and title

Date

A-3 Application Checklist

Complete this checklist to confirm all sections of this application package have been completed.

Part A: Project Description, Organizational, Financial and Legal Information

- _____ A-1 Urban Water Conservation Grant Application Cover Sheet
- _____ A-2 Application Signature Page
- _____ A-3 Application Checklist
- _____ A-4 Description of project
- _____ A-5 Maps
- _____ A-6 Statement of work, schedule
- _____ A-7 Agency authority
- _____ A-8 Operation and maintenance (O&M)
- _____ A-9 Innovation

Part B: Engineering and Hydrologic Feasibility (construction projects only)

- _____ B-1 Certification statement
- _____ B-2 Project reports and previous studies
- _____ B-3 Preliminary project plans and specifications
- _____ B-4 Construction inspection plan

Part C: Plan for Environmental Documentation and Permitting

- _____ C-1 CEQA/NEPA
- _____ C-2 Permits, easements, licenses, acquisitions, and certifications
- _____ C-3 Local land use plans
- _____ C-4 State and local statutes and regulations

Part D: Need for Project and Community Involvement

- _____ D-1 Need for project
- _____ D-2 Community involvement, support, opposition

Part E: Water Use Efficiency Improvements and Other Benefits

- _____ E-1 Water use efficiency improvements
- _____ E-2 Other project benefits

Part F: Economic Justification, Benefits to Costs Analysis

- _____ F-1 Net water savings
- _____ F-2 Project budget and budget justification
- _____ F-3 Economic efficiency
- _____ Benefit/Cost Analysis Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

A-4 Description of Project

Purpose, goals, and objectives

This project is designed to improve the irrigation efficiency for large landscape sites identified as having high unrealized conservation potential in the Yucaipa Valley Water District. This program represents a new proposed conservation program in a service area that relies on a groundwater basin that has overdraft conditions in the face of rapid growth in demand. Target sites include budget-constrained schools and parks serving lower income areas, and those sites that will continue to depend on the potable water system for the foreseeable future. YVWD is a soon to be signatory of the Urban Water Conservation Memorandum of Understanding. The YVWD has identified landscape conservation on sites with greater than one acre of irrigated landscape as a cost-effective water supply alternative. These hardware installations can be expected to produce water savings of longer persistence than the savings that can be attained through behavior change alone.

Location

The Yucaipa Valley Water District is located about 70 miles east of Los Angeles at the base of the San Bernardino Mountains in the Upper Santa Ana River Valley. The District borders on the City of Redlands to the west, San Bernardino National Forest to the north and west, Beaumont to the southeast and south, and Riverside County to the southeast. Interstate 10 runs through the southwestern portion of the District's service area.

The District's sphere of influence encompasses both water and wastewater service areas. Water service within the District's sphere of influence is provided by the Yucaipa Valley Water District (YVWD), as well as the South Mesa Mutual Water Company (SMMWC) and the Western Heights Mutual Water Company (WHMWC). The Yucaipa Valley Water District provides water to much of the Yucaipa Valley including most of the City of Yucaipa, a portion of the City of Calimesa, and unincorporated areas in San Bernardino and Riverside Counties.

Summary of methods and procedures

Yucaipa Valley WD has conducted a rigorous analysis of avoided costs and conservation alternatives in its service area. This landscape conservation program was one of highest ranked alternatives, in both potential effectiveness and cost-effectiveness. State funding would allow implementation of a conservation program reaching all sites that have been identified in the first phase of conservation planning as offering cost-effective water savings potential.

In particular, about one half of the large landscape acreage in the service area is irrigated with old inefficient hardware systems. Although YVWD works with these sites to improve timing of irrigation—switching to off-peak hours—the hardware limits the ability to conserve water. Old hardware systems are made up of aging

sprinkler heads, controllers, and pipe layouts. Software and behavior cannot overcome antiquated hardware, in terms of water conservation savings.

Examples of these sites in the City of Yucaipa include:

City Parks

- 7th and Avenue E Park
- Grandview and Freemont Park
- 1st and Avenue B Park

County of San Bernardino Facilities

- 5th Street Library
- 5th Street and Yucaipa Boulevard Sheriff's Station

School District

- California Street Elementary
- Valley Elementary at 8th Street
- 6th Street Middle School
- Sunny Side Elementary
- Park View Middle School

Examples of hardware that engineering staff have identified as strong possible candidates for these particular sites include:

- Digital control irrigation systems
- Moisture sensor controls
- Rain sensitive shut off valves
- Programmable seasonal controls

It is these sites with old hardware that will be the focus of the program. In addition, a number of these sites with old hardware are those that are not scheduled to be hooked up to the new reclaimed water system that is under development. Thus, the benefits of conservation are high in that the costs of potable water supply and treatment can be avoided. YVWD will also soon be connected to a State Water Project contractor and, thus, water conserved at landscape sites translates into reduced demand on the State Project and, ultimately, the Bay Delta ecosystem. Many of these sites also provide service to public end-uses—such as schools and parks. YVWD is a small water district with a combination of new development and older neighborhoods with low-income and elderly fixed-income customers.

Summary of expected outcomes, benefits, and costs

The expected results of this program extend beyond the identified cost savings tied to conservation. The groundwater basin will benefit from reduced pumping and the sensitive Bay Delta ecosystem can also benefit from demand reductions in YVWD. By creating early success stories and establishing customer acceptance, this program can broaden awareness of the collateral benefits of landscape conservation in the YVWD service area. Results of customer

experiences and reductions in water consumption will be monitored and tracked for integration into YVWD's long-term planning.

The total cost of the program, including in-kind contributions from agencies is approximately \$ \$160,662 In-kind contribution is \$ \$60,662. This proposal requests \$100,000 in grant funding.

The total water savings is expected to be 100 acre-feet per year, which translates into benefits (avoided costs) of \$ 54,400 per year.

A-5 Maps

Since this is not a construction project, a map is not required.

A-6 Statement of Work, Schedule

Tasks

Task 1. Review and Further Identify Irrigation Sites with High Savings Potential. YVWD field engineers have intimate knowledge of their water system, including large landscape sites to which they provide water. Only by close coordination of the District staff and large landscape customers has it been possible to serve these large demands with local groundwater alone. Through this process of coordination, it has become clear which sites are water-efficient and which are utilizing modern conservation practices. The first task will be to review the sites with high unrealized conservation potential and to assess in greater detail a strategy for hardware upgrades.

Examples of the types of upgrades that are proposed include:

- Irrigation controllers. Although most of the older sites have at least some form of controller, old controllers cannot fully take advantage of water savings opportunities that are possible using modern conservation practices. Controllers that make available repeating cycles, CIMIS-based timing, and ease of adjustment allow for more efficient programming.
- Sub-area controllers. Due to varied sub-climates (shady areas, etc.) and topography (flats and slopes) separate irrigation controllers that operate on segments of the landscape area can be used to reduce water consumption. Battery operated models might allow tailored cycles in distant areas.
- Sprinkler heads replacement and matching. Sprinkler heads that are mismatched with brass and plastic models result in water waste (mixed heads result in uneven pressure to brass heads). Sprinkler heads in high traffic areas can be replaced with durable models that will not need as frequent repairs and adjustment. Replacing old sprinkler heads allows more refined adjustment and distribution uniformity, again reducing water waste.
- Pressure regulator valves. Most sprinkler heads are designed to operate in the 25 to 30 psi range. Pressure regulators serve to keep pressure from rising too high in the irrigation system. Excessive pressure results in sprinkler head misting, wind drift, and water loss. Also, high pressure increases the incidence and severity of leakage in irrigation systems. Controlling high water pressure in the system also reduces the changes that low pressure will occur in other areas of the system that are prone to pressure loss—again resulting in more efficient use of irrigation water.

Task 2. Contact sites, develop upgrade plans, and offer incentives for implementing water-efficient irrigation equipment. Upgrade plans may already exist in some cases. If there is no existing upgrade plan, staff will coordinate with the customer to develop a plan, possibly using outside technical assistance. The plan would be developed and paid for by the customer, with assistance and coordination from YVWD staff. In return, the customers will be eligible for funding support.

As currently envisioned, we propose that the funding support be structured in one of two ways. If the customers agrees to utilize a water-budget based approach with modern conservation practices, then funding would be 100 percent of hardware upgrades up to a designated maximum amount. If a water budget approach or equivalent is not used, then the funding would be structured as a 50 percent cost share of the hardware upgrades.

Task 3. Integrate hardware incentives program into ongoing landscape conservation activities. Since more hardware savings opportunities for equipment upgrades will be identified over time, the coordination between field staff engineers and customers will be continued into the future for the duration of the grant period. It is expected that equipment upgrade funding will increase customer satisfaction, willingness-to-participate, and, ultimately, the amount of potential water savings that can be realized. Appropriate irrigation equipment can yield both improved landscape appearance and water savings. Better landscape appearance and customer satisfaction can lead to a longer life on water savings.

Task 4. Track installations and associated costs and savings. Review annually. Through a process of continual customer inquiry and feedback, the program implementation will be streamlined, improved, and evaluated over time.

Task 5. Coordination and Administration. This task involves the coordination and administration of all program elements.

Deliverables

The expected products of the grant program include the following:

- Tracking reports, quarterly and annually.
- Annual evaluation memo to the Board, including all the assessment measures listed above.
- Presentation at an evening discussion forum conducted early in the program, and thereafter at six month or one year intervals. The invitees would be past present and potential future participating landscape site managers. The presentations would cover the program elements, performance, and requests for input.
- Executive summary of the program and its costs and effectiveness for dissemination to the broader conservation community.

Schedule

Funds are being requested over a three-year implementation period (Table A and Figure 1). The program implementation would be front-loaded in the first year of program implementation, to maximize early water savings.

Table A - Schedule

Task	Start Date	Duration (Days)	End Date
Task 1: Determine Equipment Upgrades	1-Jul-2003	62	31-Aug-03
Task 2: Site Contact and Funding	1-Sep-2003	300	26-Jun-04
Task 3: Integrate Incentives to Ongoing Program	1-Sep-2003	900	16-Feb-06
Task 4: Tracking and Reporting	1-May-2004	650	9-Feb-06
Task 5: Coordination and Administration	1-Jul-2003	950	4-Feb-06

Separability of tasks

The tasks listed above are not readily separated. However, the scale of the project can be adjusted to fit alternative budgets.

Projected costs by task

Table B shows the project costs by task, with cost shares calculated.

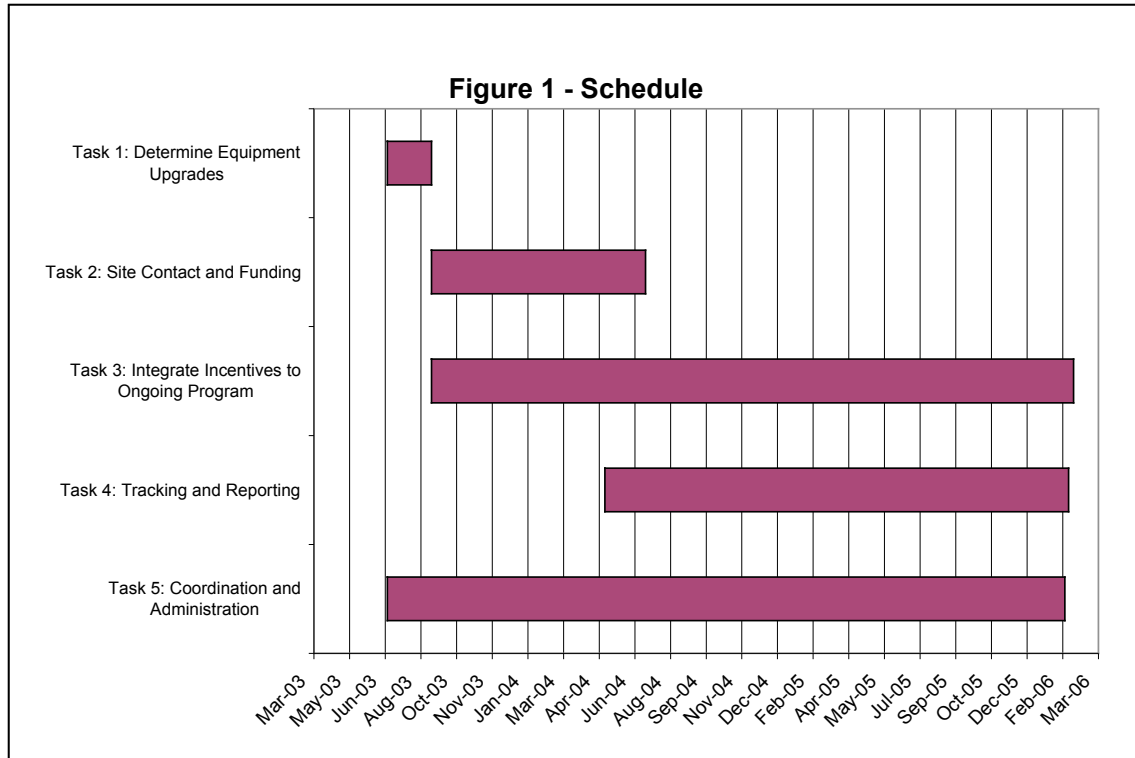


Table B: Budget for YVWD Irrigation System Efficiency Improvements

SCVWD: Water									
SCVWD: Water Use Efficiency Unit Manager			Conservation Specialist 1		SCVWD: Water Conservation Specialist 2			Total	
Rate:		\$53.94/hr.		\$32.61/hr.		\$35.99/hr.			
Task	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost	
Task 1: Determine Equipment Upgrades	18	\$ 949	35	\$ 1,148	35	\$ 1,267	88	\$ 3,364	
Task 2: Site Contact and Funding	24	\$ 1,295	48	\$ 1,565	48	\$ 1,728	120	\$ 4,587	
Task 3: Integrate Incentives to Ongoing Program	16	\$ 863	32	\$ 1,044	32	\$ 1,152	80	\$ 3,058	
Task 4: Tracking and Reporting	16	\$ 863	32	\$ 1,044	32	\$ 1,152	80	\$ 3,058	
Task 5: Coordination and Administration	16	\$ 863	32	\$ 1,044	32	\$ 1,152	80	\$ 3,058	
Total	90	\$ 4,833	179	\$ 5,844	179	\$ 6,449	448	\$ 17,126	
Collaborating Agencies: Collaborating Agencies:									
Water Use Efficiency Unit Manager			Water Conservation Specialist 1		Collaborating Agencies: Water Conservation Specialist 2			Total	
Task	Hours	\$53.94/hr.	Hours	\$32.61/hr.	Hours	\$35.99/hr.	Hours	\$/Task	
Task 1: Determine Equipment Upgrades	4	\$ 216	8	\$ 261	8	\$ 288	20	\$ 765	
Task 2: Site Contact and Funding	8	\$ 432	16	\$ 522	16	\$ 576	40	\$ 1,529	
Task 3: Integrate Incentives to Ongoing Program	4	\$ 216	8	\$ 261	8	\$ 288	20	\$ 765	
Task 4: Tracking and Reporting	8	\$ 432	16	\$ 522	16	\$ 576	40	\$ 1,529	
Task 5: Coordination and Administration	2	\$ 108	4	\$ 130	4	\$ 144	10	\$ 382	
Total	26	\$ 1,402	52	\$ 1,696	52	\$ 1,871	130	\$ 4,970	
Evaluation Contractor									
Task		Hours	\$100/hr.					Hours	\$/Task
Task 1: Determine Equipment Upgrades	-	\$ -					-	\$ -	
Task 2: Site Contact and Funding	20	\$ 2,000					20	\$ 2,000	
Task 3: Integrate Incentives to Ongoing Program	30	\$ 3,000					30	\$ 3,000	
Task 4: Tracking and Reporting	55	\$ 5,500					55	\$ 5,500	
Task 5: Coordination and Administration	-	\$ -					-	\$ -	
Total	105	\$ 10,500					105	\$ 10,500	

Summary	SCVWD	Collaborating Agencies	Evaluation Contractor	
Raw Labor	\$ 17,126	\$ 4,970	\$ 10,500	\$ 32,596
Overhead (@120.23%)*	20,591	5,975	included	\$ 26,566
Local Travel and Transportation	\$ 500	\$ 500	\$ 500	\$ 1,500
Cofunding for Customers Participating	\$ 100,000			\$ 100,000
Total Project Costs	\$ 138,217	\$ 11,445	\$ 11,000	\$ 160,662
Participant Agency Costs	\$ 38,217	\$ 11,445	\$ 11,000	\$ 60,662
Requested Grant Funding = Cofunding for Customer	\$ 100,000	\$ -	\$ -	\$ 100,000

*FY 2000-01 SCVWD's Federal Office of Management & Budget (OMB) Circular A-87 Overhead Rate = 120.23% (Will apply current rate to Actual Claim.)

Quarterly expenditure projection

Table C shows the projected quarterly expenditures.

Table C - Quarterly Expenditure Projection				
Quarter	Percent	Total	Grant	
1	15.0%	\$ 24,099	\$ 15,000	
2	20.0%	\$ 32,132	\$ 20,000	
3	10.0%	\$ 16,066	\$ 10,000	
4	10.0%	\$ 16,066	\$ 10,000	
5	5.0%	\$ 8,033	\$ 5,000	
6	5.0%	\$ 8,033	\$ 5,000	
7	5.0%	\$ 8,033	\$ 5,000	
8	5.0%	\$ 8,033	\$ 5,000	
9	5.0%	\$ 8,033	\$ 5,000	
10	5.0%	\$ 8,033	\$ 5,000	
11	5.0%	\$ 8,033	\$ 5,000	
12	10.0%	\$ 16,066	\$ 10,000	
Total	100.0%	\$ 160,662	\$ 100,000	

Summary: Technical Adequacy and Readiness to Proceed

The proposed program represents an important opportunity for conservation savings that can be realized with equipment upgrades:

- Technically, the case for water savings is straight forward in for the large landscape sites in the service area with aging irrigation equipment. Further, targeting those sites that will stay in the potable system, or stay on it longer, maximizes cost-effectiveness.
- By coordinating with customers to upgrade equipment in combination with an up to date irrigation plan, the grant funds are effectively leveraged in that the customer and YVWD develop and implement the irrigation and maintenance schedule that complements the hardware.
- Readiness could not be more so. YVWD is embarking on a major plan to construct reclaimed water treatment and distribution facilities, a rather capital-intensive enterprise that can potentially be delayed if conservation is realized. Further, the agency is planning to sign the MOU Regarding Urban Water Conservation in the coming months and it will be embarking on a plan to fulfill conservation best management practices.

A-7 Monitoring and Evaluation

The benefits expected from this project include:

- Reduced supply, treatment, and distribution costs;
- Reduced stress on the groundwater basin;
- Reduced Bay Delta environmental stress;
- Healthier landscapes with reduced replacement costs; and
- Reduced dry-season run off and surface water flow contamination.

A more detailed description of the benefits is included in Section E below.

Assessment procedures:

This program includes a focused evaluation component in the program to assess costs and savings and to assure consistency with YVWD's Water Master Plan. In particular:

- Cost data will be maintained by YVWD;
- Savings can be assessed with billing histories, which are already maintained at the District; and
- A summary and evaluation report to be available at the end of the program.

Performance Measures

Performance will be evaluated with regard to the goals and objectives of the program. Measures of performance will include:

- The measured water savings as determined with billing system histories.
- The share of appropriate identified equipment upgrades that have been implemented.
- Costs of the program as tracked by program administrators.
- Cost per acre-foot savings as calculated from the above data.
- Persistence of savings as tracked by the program over time.

Data will be tracked by maintained by staff and will be available in readily accessible formats (e.g. Excel or Access).

Products

The expected products of the grant program include the following:

- Tracking reports, produced quarterly and annually.
- An annual evaluation memo to the Board, including all the assessment measures listed above.
- Presentations at an evening discussion forum conducted early in the program and thereafter at six month or one year intervals. The invitees would be past, present and potential future participating landscape site managers. The presentations would cover the program elements, performance, and requests for input.
- A brief executive summary of the project to help disseminate the results of this study to the broader conservation community.

A-8 Qualifications of the Applicant and Cooperators

Include a resume(s) of the project manager(s). Resumes may be attached to the end of the Application and shall not exceed two pages. Charles Bailey, Utilities Operations Manager of the Yucaipa Valley Water District (resume attached) will be the Project Manager for this project.

Identify and describe the role of any external cooperators that will be used for this project.

A-9 Innovation

The innovative work involved with the grant is in the implementation and delivery mechanism of this conservation program, including:

- Coordination between YVWD staff and landscape customers and managers;
- Integrating the hardware upgrades with information and education on efficient landscape conservation and management.

A-10 Agency Authority

Address the following five questions pertaining specifically to this application.

1. Does the applicant (official signing A-2, Application Signature Page) have the legal authority to submit an application and to enter into a funding contract with the State? Provide documentation such as an agency board resolution or other evidence of authority.

Yes.

2. What is the legal authority under which the applicant was formed and is authorized to operate?

YVWD was formed under the State Water Code, Division 12, Section 30000, which concerns County Water Districts.

3. Is the applicant required to hold an election before entering into a funding contract with the State?

No.

4. Will the funding agreement between the applicant and the State be subject to review and/or approval by other government agencies? If yes, identify all such agencies (e.g. Local Area Formation Commission, local governments, U.S. Forest Service, California Coastal Commission, California Department of Health Services, etc.).

The specific upgrades need to be coordinated with the City of Calimesa and Yucaipa building departments; however, it is not necessary to get their approval for the funding agreement per se.

5. Is there any pending litigation that may impact the financial condition of the applicant, the operation of the water facilities, or its ability to complete the proposed project? If none is pending, so state.

No.

A-11 Operations and Maintenance

(Required for construction projects only, including meter installations.)

Since this is not a construction project, this section is not applicable.

Application Part B—Engineering and Hydrologic Feasibility

(Application Part B required for construction projects only, including meter installations.)

The proposed project does not involve construction. This section of the application is not applicable.

***Application Part C—Plan for Completion of
Environmental Documentation and Permitting
Requirements***

The application must include a plan for compliance with all applicable environmental requirements. The plan should address all the potential environmental, social and economic impacts of the proposed project, including mitigation, required under the California Environmental Quality Act (CEQA) and, if applicable, the National Environmental Policy Act (NEPA). The plan should also address compliance with local, county, State, and federal permitting requirements. If this project is not subject to CEQA or NEPA, so state in this section.

C-1 California Environmental Quality Act and National Environmental Policy Act

The proposed project in this application is not likely to be subject to CEQA/NEPA requirements.

C-2 Permits, Easements, Licenses, Acquisitions, and Certifications

Not applicable.

C-3 Local Land Use Plans

Not applicable.

C-4 Applicable Legal Requirements

Not applicable.

Application Part D- Need for Project and Community Involvement

D-1 Need for the Project

Urgency

The urgency for the proposed project stems from a combination of strain on the existing groundwater basin and rapid population growth in the service territory. Current water demand is approximately 14,500 AF/yr. According the 2000 Urban Water Management Plan, demand is expected to grow to 27,880 AF/yr by 2020. Pumping from the Yucaipa Groundwater Basin is approximately 9,000 for the District—approximately the safe yield for the Basin. However, both Western Heights and South Mesa Water Companies each pump from the basin an additional average of 2,400 AF/yr resulting in pumping greatly in excess of safe yield.

Although YVWD will soon have access to water from the State Water Project by way of an intermediate supplier, indeed this new source is not sufficient in volume or reliability to meet growing demand. YVWD has been aggressively investing in water recycling facilities, an expensive but necessary means to meet growing demand. It is expected that perhaps 24 percent of total demand in the area will be met with recycled water by 2020 (UWMP 2000).

This project would serve to address environmental needs in the Bay Delta. The Bay-Delta ecosystem is stressed in terms of the balance between supply and demand, water quality in surface and groundwater, salt-water intrusion, and habitat management. It has become increasingly clear that careful planning is needed to avoid and mitigate problems surrounding surface run off as well as supply.

Although there have been major recent advances in the efficiency of water irrigation equipment, there is relatively less awareness of the benefits for plant health, landscape maintenance, and runoff reduction among customers.

Water system condition

The Yucaipa Valley Water District has traditionally met the bulk of service area customer needs from groundwater through the District's primary water wells. Most of these wells pump from the Yucaipa Groundwater Basin, with less than 1,000 acre-feet per year (afy) being pumped from the Beaumont Basin. The District currently has thirty-four active and standby groundwater wells available for use. Due to the age and poor condition of some of these well facilities, only 20 of the active wells are anticipated to remain in service through 2010. The firm pumping capacity projected for 2010 is approximately 13,800 gallons per minute (gpm), or about 19.8 mgd. For planning purposes it is assumed that 15 percent of the firm capacity could be unavailable during the maximum day demand due to maintenance or unplanned outages. This reduces the District's available well capacity to 11,700 gpm or 16.8 mgd.

Groundwater quality for Total Dissolved Solids (TDS) is well below the national secondary standard of 500 mg/L for drinking water. Measured nitrate (as NO₃) is also well below the EPA and State Maximum Contaminant Level (MCL) of 45 mg/L for most wells, although some of the District's wells have experienced high nitrates if not pumped on a regular basis. The District typically will not utilize a well if the nitrate level is about 40 mg/L (as NO₃), even though the MCL for nitrate is 45 mg/L.

The Yucaipa Groundwater Basin is subdivided into seven sub-basins: Mill Creek, Gateway, Crafton, Oak Glen, Calimesa, Wilson Creek, and San Timoteo. The Wilson Creek and Calimesa sub-basins are the largest and most important of these sub-basins. Total storage capacity of these basins is estimated at 807,517 acre-feet (Fox, 1990) or (263,000 million gallons). Groundwater is typically reached within 200-280 feet below the land surface.

In 1996 the District upgraded the Oak Glen Filtration Plant to treat surface water collected in the Oak Glen watershed in conformance with the Surface Water Drinking Rule. The design capacity of the plant is 550 gallons per minute (0.8 mgd). Treated flows are typically limited by declining surface water availability that has reached flows as low as 250 gpm (0.4 mgd). The Plant receives water primarily from the Birch Creek intake, Oak Creek intake, and Adams Tunnel (Well 25). Minimal water may also flow into the raw water pipeline from Worthington Tunnel and Clark Tunnel. Back Creek is also a source but has not been used since 1992 as is listed as a standby source. These sources are both minor and relatively unreliable due to their greater availability only in wet periods.

Though the Santa Ana – Mill Creek Cooperative Water Project Agreement, the District is permitted to exchange up to 32 cfs (20.7 mgd)) of State Water Project water for Mill Creek water when available. This source is highly variable, however, depending upon local hydrology. In addition to the Mill Creek supplies, the District will be able to receive exchange water from Santa Ana River water right holders once the Regional Water Filtration Facility is completed and connected to the State Water Project East Branch extension pipeline in 2005. SWP water will be available directly or by exchange when the East Branch extension pipeline is completed in 2003. This water is available for groundwater recharge and non-potable use until the Yucaipa Valley Regional Water Filtration Facility is constructed. SWP reliability has been negatively affected due to the State's inability to complete the project as contracted.

Consistency with other water management plans

The project is consistent with other state, regional, and local conservation planning activities:

Demand management is integral and important to the YVWD Water Master Plan.

Urban Water Management Plans. Irrigation savings can contribute to achieving

year-round water savings as well as crucial peak-season savings.

MOU and BMPs. YVWD is currently preparing to sign the Memorandum of Understanding Regarding Urban Water Conservation. This program proposed in this application generally contributes to the MOU conservation objectives. In particular, the program would dovetail with BMP 5 if used in conjunction with a water budget.

Local groundwater basin management plans would be supported by efficient water use and reduced contaminant entry through deep percolation.

Impact if not constructed

The impacts of not implementing the project are: (1) continued increase in stresses on the water supply system; (2) higher difficulty in managing groundwater basin reliability and quality; (3) inability to contribute to CALFED objectives by reducing load on the State Water Project and Bay Delta Ecosystem.

D-2 Outreach, Community Involvement, Support, Opposition

Community based organizations and watershed groups

As part of the early planning of the project, we propose to identify community based organizations and watershed groups who may have an interest in this program. The following categories indicate the breadth of this outreach:

- Landscape organizations and “green” professionals
- Large landscape owners/customers
- Trade groups (golf association)
- Environmental interests regarding parks, watershed, etc.

We envision an early project meeting or Board Workshop to receive community and professional input. We also plan later conferences and/or correspondence with professionals involved with implementing the program.

Fit with local agency plans

YVWD Water Master Plan. Demand management is an important to the overall planning for supply reliability in the service area.

Water Reclamation. Since water recycling is a large component of supply augmentation to meet rapidly growing demand, conservation hardware, such as that proposed herein can either allow for later construction or higher reliability—which results in economic savings.

Urban Water Management Plans. Irrigation savings can contribute to achieving year-round water savings as well as crucial peak-season savings.

Local groundwater basin management plans would be supported by efficient water use and reduced contaminant entry through deep percolation.

Local agencies

This projects as proposed in this grant application would be administered and conducted primarily by the Yucaipa Valley Water District. As a water, groundwater, and wastewater agency, the YVWD has strong reasons itself to investigate landscape irrigation efficiency. However, since the water system is complex in the region, and since there are two other water retailers in the sphere of influence, irrigation technology has potential benefits across a number of agency jurisdictions. YVWD expects to collaborate with the other agencies in the region on this project. More importantly, YVWD seeks to build a more concrete

working relationship with other agencies to more efficiently and effectively implement demand management and, more generally, sound water management policies.

The general roles of the external cooperating agencies will consist of the following:

- Assistance in project direction
- Potential funding support
- Assistance with site location
- Assistance with the understanding of water supply and demand management benefits from different agency perspectives: groundwater, wastewater, reclamation, wholesale and retail water supply.
- Identify cost-effective opportunities for cooperation on additional programs where mutually beneficial.
- Assessment of implementation barriers and opportunities at different agency perspectives.

Some of the potential beneficiaries and collaborators for this project include the following:

- a) City of Yucaipa
- b) City of Calimesa
- c) Western Heights Water Company
- d) South Mesa Water Company
- e) San Bernardino Valley Municipal Water District
- f) San Geronio Pass Water Agency

Opposition

We have not identified any potential interests that would be in opposition to this program.

***Application Part E—Water Use Efficiency
Improvements and Other Benefits***

E-1 Water Use Efficiency Improvements

The application states:

“For purposes of this application, water use efficiency means an action or an activity that causes the net value of the beneficial use of water to be increased. This increase can be due to a decrease in the costs associated with the use of that water (e.g., reduced acquisition and/or treatment costs), an increase in the value generated by the use of that water (e.g., increased urban, agricultural, or environmental water supply reliability) or both.”

Decrease in cost of using water:

The following are benefits of landscape conservation as proposed in this application, in terms of a decrease in the costs associated with the use of water:

- Reduced water supply costs. Landscape conservation has the ability to, at the margin, to allow for deferment or downsizing of water supply, distribution, treatment, and reclamation facilities that are being so intensively developed in the area.
- The costs of groundwater overdraft conditions can be reduced in terms of the decrease in the probability and severity of shortage, reduction in the possibility of contamination or other damage to the groundwater basin due to poor management.
- Less mowing and pruning because excess water accelerates growth.
- A reduced fertilizer requirement as over-irrigating leaches water from the root zone.
- Less property damage-sprinkler runoff water can damage parking lot pavement and over-spray can damage buildings and wooden fences.
- Less landscape chemicals enter the groundwater basin through deep percolation.
- Fewer pesticides because lush growth from over-watering attracts pests.

Increased in value generated by the use of the water:

The increase in value generated by the efficient use of the water in this project is nothing less than the value of the existing and developing residential areas.

Although we do not mean to suggest that landscape conservation is solely responsible for water supply and reliability needs, it contributes in important ways. The area is experiencing rapid growth and supply alternatives are very capital intensive. Landscape conservation is a cost-effective way to augment the integrated water supply needs.

Clearly the health landscape will increase the property values and use value for large landscape sites. For residential sites, improved landscape health increase the value by creating a intrinsically more desirable setting. For golf courses, health landscape leads to better playing turf and golfer votes of confidence.

E-2 Other Project Benefits

This project will have several important positive impacts on the Bay-Delta ecosystem:

- Replacing and repairing irrigation equipment will reduce demand for water imported from the Bay-Delta to urban water agencies.
- Replacing and repairing irrigation equipment will reduce the introduction of contaminants in surface dry-season runoff and deep percolation to groundwater. that are part of the Bay-Delta ecosystem.
- Efficient irrigation systems are also more energy efficient in terms of pumping and treatment, saving the Bay-Delta ecosystem an increment of environmental damage resulting from energy production and distribution.

This project is consistent with the CALFED objectives in that it:

- Contributes to water quality by reducing contaminants to the ecosystem;
- Reduces demand allowing for improvements in habitat and ecosystem functions; and
- Generally reduces the mismatch between Bay-Delta water supply and demand.

***Application Part F – Economic Justification:
Benefits to Costs***

F-1 Net Water Savings

The application defines net savings as follows:

“Net water savings means savings achieved by reducing water losses that are currently going to an “unusable” destination from an already-developed primary water source or sources. Net water savings can be achieved by:

- Reducing losses to the atmosphere through evaporation or transpiration
- Reducing losses to saline or other unusable aquifers or water bodies through percolation or surface flows.”

In what follows, we consider first savings calculations, then discuss the two criteria of loss to atmosphere and to unusable water bodies.

Water savings

We expect considerable savings in water consumed by the sites that participate in this program. Water needs for the area have been estimated based on evapotranspiration, plant palate, precipitation and other factors as follows:

Average use Based on Water Requirements (in/acre/yr)

Very low	31.03
Low	37.16
Medium	46.44
Medium High	52.71
High	61.91

In terms of savings, reducing water use from current consumption to an efficiently level would save a considerable amount—assumed to be 6 inches per acre per year for the purpose of this application. We recognize that savings at a particular site may be considerably higher or lower than this assumption; however, it is a reasonable and conservative figure for planning purposes, especially considering the ability to target sites with aging equipment.

Reduce loss to atmosphere through evaporation or transpiration

One of the outcomes is clearly loss to evaporation and transpiration. For example, controllers allow more control to water during the night to reduce evaporation associated with day irrigation. Runoff and puddles in streets, landscapes, and other areas also evaporates, in part, to the atmosphere.

Plants that are over-watered also, we argue, transpire more water than properly watered landscapes. The hardware offered in this program will improve the ability to water at appropriate levels.

Reducing losses to saline or other unusable aquifers or water bodies

through percolation or surface flows

Water that runs off and that does not evaporate ends up ultimately in surface water sewer systems, drains, and creeks, and/or the water percolates to either shallow or deep levels. Surface water may flow out of the service territory to the greater Santa Ana River Watershed to groundwater percolation downstream or ultimately to the Pacific Ocean. Percolated water may indeed percolate, at least in part, to deep aquifers that store potable water.

Most importantly for the Yucaipa Valley considering the hydrologic conditions and opportunities, water conserved by demand management can be stored for seasonal or drought use in groundwater basins. Conservation allows the water to be stored where there will not be evaporation or flow to unusable aquifers or water bodies.

F-2 Project Budget and Budget Justification

The budgeted costs include planning, purchase and installation of project-related materials, and administration.

None of the following items are in the budget:

1. Costs, other than those noted above, incurred prior to applying for or receiving funding,
2. Operation and maintenance costs,
3. Purchase of equipment not an integral part of the project,
4. Establishing a reserve fund,
5. Purchase of water supplies,
6. Replacement of existing funding for ongoing programs,
7. Support of existing agency requirements and mandates,
8. Purchase of land in excess of the minimum required acreage necessary to operate as an integral part of the project, as set forth and detailed by engineering and feasibility studies, and
9. Payment of principal or interest of existing indebtedness or any interest payments unless:
 - a) The debt is incurred after issuance of a letter of commitment of funds by DWR;
 - b) The DWR agrees in writing to the eligibility of the costs for reimbursement before the debt is incurred; and
 - c) The purposes for which the debt is incurred are otherwise eligible project costs.

Project Budget

The detailed budget presented in Table B in Section A shows that following items are included:

- **Planning/Design/Engineering.** The justification of this cost item is that it will take time to review potential landscape sites and to plan their approach within the program. Also, included in this item is evaluation support to provide the project with an independent evaluation of the cost and savings of the program over time.
- **Materials/Installation.** The justification for the materials and installation items is that this is the core of the program offered. The point of the proposed program is that although conservation opportunities exist, funds are needed to pay for the capital cost of upgrading.
- **Administration.** Administration will guide and review each element of the program to assure focus, direction, accountability, and compliance with administrative requirement of the agencies and of the Proposition 13 Grant.

Tables 1 and 2 in Appendix A have entered in them the program costs in the required format according to the application.

F-3 Economic Efficiency

The direct economic benefits accruing to project benefits include:

- Avoided cost of source water supply
- Avoided treatment cost
- Avoided distribution cost
- Avoided costs of landscape over-watering

The YVWD has estimated the benefits of conservation activities. The specific benefits included in the calculation of the avoided costs in these three categories include:

- Potable Indoor. Benefits include supply, treatment, distribution, wastewater collection, wastewater treatment, and storage.
- Small landscape (SF residential and commercial). Benefits include supply, treatment, distribution and storage.
- Large landscape. Benefits include supply, distribution, and storage.

In dollar terms, the benefits have been calculated as follows:

Non-Potable	\$213/AF
Potable Outdoor	\$450/AF
Potable Indoor	\$544/AF

Analysis assumptions

We have used the following assumptions in determining the benefits and costs for the proposed project:

- **Period of analysis.** We have used a period of analysis of 10 years, which accounts for 10 years of effective savings.
- **Inflation and escalation.** We have assumed zero escalation and inflation.
- **Discount rate.** We have used the recommended discount rate of 6 percent.
- **Dollar value base year.** All benefits and costs are expressed in current year dollars--Year 2002 dollars.

- **Multiple-funded projects.** The economic analysis has been conducted for the entire project, regardless of funding sources.

Project costs. For Tables 1, 2, and 3, all costs required to achieve project benefits have been included.

Avoided Cost of Current Supply Source (Table 4a). Since there are specific water supply projects that are avoidable, we use Table 4b.

Alternative Cost of Future Supply Sources (Table 4b). As mentioned above, the avoided supply costs assumes that new supply projects can be downsized proportionally.

Water Supply Vendibility (Table 4c). This project does not anticipate changes in revenue from water sales to existing customers, new customers, or other agencies.

Appendix A- Benefit/Cost Analysis Tables

Table 1: Capital Costs

Table 2: Annual Operations and Maintenance Costs

Table 3: Total Annual Costs

Table 4a: Water Supply Benefits: Avoided Cost of Current Supply Sources

Table 4b: Water Supply Benefits: Alternative Cost of Future Supply Sources

Table 4c: Water Supply Benefits: Supplier Revenue (Vendibility)

Table 4d: Total Water Supply Benefits

Table 5: Benefit/Cost Ratio

Table 6: Capital Recovery Factor

Table 1: Capital Costs

Table 2: Annual Operations and Maintenance Costs

Table 3: Total Annual Costs

Table 4a: Water Supply Benefits: Avoided Cost of Current Supply Sources

Table 4b: Water Supply Benefits: Alternative Cost of Future Supply Sources

Table 4c: Water Supply Benefits: Supplier Revenue (Vendibility)

Table 4d: Total Water Supply Benefits

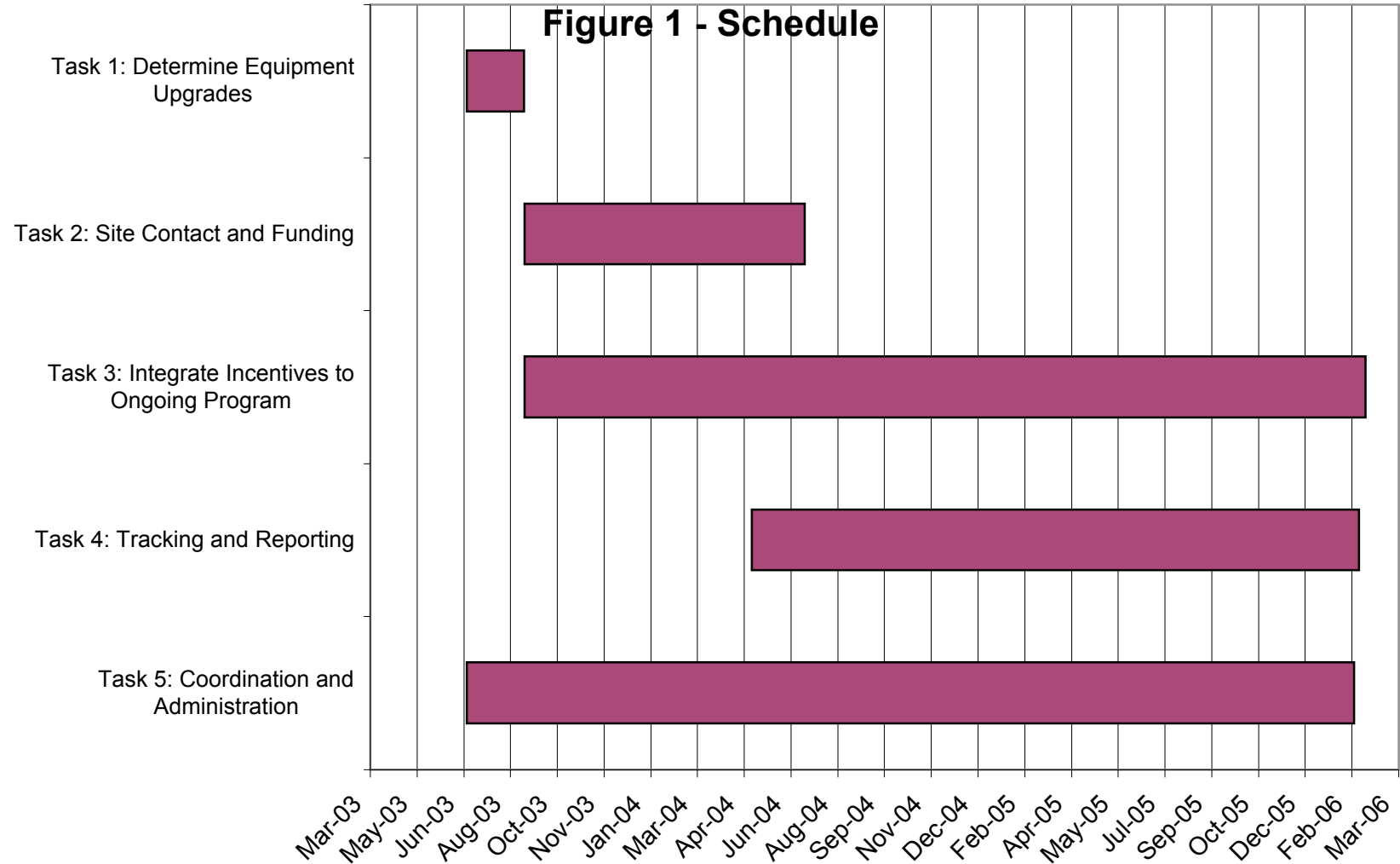
Table 5: Benefit/Cost Ratio

Table 6: Capital Recovery Factor

Project Coordination
Charlie Bailey – Utilities Operations Manager

- Employed with Yucaipa Valley Water District since 1973
- Supervisor with the District since 1979
- Six years of experience in the installation and maintenance of irrigation systems for the Imsand Corp. prior to my employment with Yucaipa Valley Water District
- Certified Distribution and Treatment Operator
- Public relations speaker on water conservation since 1980
- Hands on Supervisor in the rehabilitation and replacement of reservoirs, pipelines, pumps, sewer mains, manholes, lift stations and equipment
- Designed/plan checked water and sewer systems for new development
- Final inspector of all water, sewer and non-potable systems constructed for Yucaipa Valley Water District prior to acceptance
- Dedicated to the improvement/conservation of water, sewer and non-potable facilities within the Yucaipa Valley

Figure 1 - Schedule



Applicant: Yucaipa Valley Water District

THE TABLES ARE FORMATTED WITH FORMULAS: FILL IN THE SHADED AREAS ONLY

Table 1: Capital Costs

	Capital Cost Category (a)	Cost (b)	Contingency Percent (c)	Contingency \$ (d) (bxc)	Subtotal (e) (b+d)
(a)	Land Purchase/Easement	0	0.00%	0	0
(b)	Planning/Design/Engineering	14,629	0.00%	0	14,629
(c)	Materials/Installation	141,092	0.00%	0	141,092
(d)	Structures	0	0.00%	0	0
(e)	Equipment Purchases/Rentals	0	0.00%	0	0
(f)	Environmental Mitigation/Enhancement	0	0.00%	0	0
(g)	Construction/Administration/Overhead	4,941	0.00%	0	4,941
(h)	Project Legal/License Fees	0	0.00%	0	0
(i)	Other	0	0.00%	0	0
(j)	Total (1) (a + ... + i)				160,662
(k)	Capital Recovery Factor: Use Table 6				0.1359
(l)	Annual Capital Costs (j x k)				21,834

(1) Costs must match Project Budget prepared in Section F-2.

Applicant: Yucaipa Valley Water District

Table 2: Annual Operations and Maintenance Costs

Administration (a)	Operations (b)	Maintenance (c)	Other (d)	Total (e)
0	0	0	0	0

Table 3: Total Annual Costs

Annual Capital Costs (1) (a)	Annual O&M Costs (2) (b)	Total Annual Costs (c) (a+b)
21,834	0	21,834

(1) From Table 1, line (l)

(2) From Table 2, column (e)

Applicant: Yucaipa Valley Water District

Table 4: Water Supply Benefits
(2002 Dollars)

Net water savings (acre-feet/year) **100** <== Cell (E6)

4a. Avoided Costs of Current Supply Sources

Sources of Supply	Cost of Water (\$/AF)	Annual Displaced Water Supply (AF)	Annual Avoided Costs (\$)
(a)	(b)	(c)	(d)
			(b x c)
Non-Potable	\$213		0
Potable Outdoor	\$450		0
Potable Indoor	\$544	100	54400
			0
			0
Total			54400

4b. Alternative Costs of Future Supply Sources

Future Supply Sources	Total Capital Costs (\$)	Capital Recovery Factor (1)	Annual Capital Costs (\$)	Annual O&M Costs (\$)	Total Annual Costs (\$)	Supply AF (g)	Unit Cost \$/AF (h)	Annual Avoided Costs (\$)
(a)	(b)	(c)	(d)	(e)	(f)		=(g/h)	(i)
			(bxc)		(d+e)			=(E6*i)
			0		0			
			0		0			
			0		0			
			0		0			
			0		0			
Total					0			0

(1) Use number from Capital Recovery Factor Table 6

4c. Water Supplier Revenue (Vendability)

Parties Purchasing Project Supplies	Amount of Water to be Sold (AF)	Selling Price (\$/AF)	Expected Frequency of Sales (1) (%)	Expected Selling Price (\$/AF)	"Option" Fee (2) (\$/AF)	Total Selling Price (\$/AF)	Annual Expected Water Sale Revenue (\$)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)
				(cxd)		(e+f)	(b x g)
				0		0	0
				0		0	0
				0		0	0
				0		0	0
				0		0	0
Total							0

(1) During the analysis period, what percentage of years are water sales expected to occur?

For example, if water will only be sold half of the years, enter 50% (0.5).

(2) "Option" fees are paid by a contracting agency to a selling agency to maintain the right of the contracting agency to buy water whenever needed. Although the water may not be purchased every year, the fee is usually paid every year.

Table 4d. Total Water Supply Benefits

(a) Annual Avoided Costs of Current Supply Sources from 4a, column (d)			54,400
(b) Annual Avoided Costs of Alternative Future Supply Sources from 4b, column (f)			0
(c) Annual Expected Water Sale Revenue from 4c, column (h)			0
(d) Total Net Annual Water Supply Benefit (\$) (a+b+c)			
			54,400

Applicant: Yucaipa Valley Water District

Table 5: Benefit/Cost Ratio

Project Benefits (\$)(1)	54,400
Project Costs (\$)(2)	21,834
Benefit/Cost Ratio	2.49

(1) From Table 4d, row (d): Total Annual Water Supply Benefits

(2) From Table 3. column (c) : Total Annual Costs

Table 6: Capital Recovery Table (6%)

Life of Project (in years)	Capital Recovery Factor
7	0.1791
8	0.1610
9	0.1470
10	0.1359
11	0.1268
12	0.1193
13	0.1130
14	0.1076
15	0.1030
16	0.0990
17	0.0954
18	0.0924
19	0.0896
20	0.0872
21	0.0850
22	0.0830
23	0.0813
24	0.0797
25	0.0782
26	0.0769
27	0.0757
28	0.0746
29	0.0736
30	0.0726
31	0.0718
32	0.0710
33	0.0703
34	0.0696
35	0.0690
36	0.0684
37	0.0679
38	0.0674
39	0.0669
40	0.0665
41	0.0661
42	0.0657
43	0.0653
44	0.0650
45	0.0647
46	0.0644
47	0.0641
48	0.0639
49	0.0637
50	0.0634